

Patent Claims

1. Method for fabricating a trench isolation structure, comprising the following steps:

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Forming a mask (3) on a substrate (1);

Forming at least one trench (2) in the substrate (1) by means of the mask (3);

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Carrying out selective deposition of a first insulation material (5) to at least partially fill the at least one trench (2) in the substrate (1) with the insulation material (5) in the presence of the mask (3); and

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applying a second insulation material (6) over the entire surface of the structure in order to fill the at least one trench (2) in the substrate (1) at least up to the top side of the mask (3).

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2. Method for fabricating a trench isolation structure according to Claim 1, characterized in that the substrate (1) is made from silicon, the mask is made from silicon nitride and the first and second insulation materials (5, 25 6) are formed from silicon oxide.

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3. Method for fabricating a trench isolation structure according to Claim 1, characterized in that following the selective deposition a conditioning step is carried out in order to compact the first insulation material (5).

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4. Method for fabricating a trench isolation structure according to Claim 1 characterized in that the second insulation material (6) is applied by means of an HDP process ("High Density Plasma" process), preferably in the same process tool.

5. Method for fabricating a trench isolation structure according to claim 1, characterized in that the second insulation material (6) is planarized by chemical mechanical polishing (CMP) on the mask (3).